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ABSTRACT

Schema theory may be significant in determining if and how news audiences process information. For any given news topic, people have from none to many schemata (cognitive structures that represent organized knowledge about a given concept or type of stimulus abstracted from prior experience) upon which to draw. Models of how schemata are used should illustrate a process, and in the case of news media and information processing, the process may be associated with effective information transmission and retention between the news media and the individuals. A "data-pool" model offered by D. A. Norman and D. G. Bobrow traces the process by which schemata are activated, but fails to explain adequately the precise channels through which specific types of information must pass during information processing. It also cannot be tested adequately for its merit. An 11-stage process model for schema theory developed by R. Axelrod provides for processing of information based on a series of "yes" or "no" questions. This model has an "escape valve" or a means for departure of information without interpretation. The R. Hastie information processing model suggests that people must react to an event in one of two ways: either find an appropriate schema or begin the construction of a new schema. Since research in the area of mass media information processing is relatively new, it seems best to work with a model that can be easily operationalized, moving later to more complex plans. In view of this, the Hastie model offers the greatest utility for mass communications researchers. A five-page list of references concludes the document. (SRT)

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APPLYING SCHEMA THEORY TO MASS MEDIA INFORMATION PROCESSING:

Moving Toward A Formal Model

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PURPOSE

The purpose of this paper is to explore the application of the schema concept to the processing of news and information. The following set of theoretical assumptions which underlie this review are drawn from the social psychology and political science literature.

1. People use schemata in the course of processing information presented by the mass media.
2. The number of schemata and the degree to which each schema is utilized by an individual can be measured.
3. A limited number of schemata can be identified for any given news topic content area such as politics or economics.

These assumptions suggest that the schema concept may be of significant utility in terms of assessing the information processing tendencies of news audiences. The following set of propositions stem from these assumptions.

1. It is possible to assess shared processing tendencies of audience members by measuring the degree to which individuals utilize similar schemata.
2. Mass media information providers can present media audience segments with the most processable information packages by understanding information processing potential and limitations illuminated by schema theory.

Thus from an applied standpoint, media messages might be tailored to meet the processing needs of audiences within given media markets. This report will thus synthesize literature from related disciplines such as social psychology and political science in the interest of applying a schema processing model to news and information processing along with evidence suggesting that the model is useful for communication researchers.

INTRODUCTION

What causes a person to decide to read one article in a newspaper over another? Why does a person attend to several news items on the World News Tonight while apparently selectively "tuning out" others? What prompts a person to decide to subscribe to Sports Illustrated over Redbook or the Ladies Home Journal?

The answer seems simple. Different people are interested in different types of information. Certainly people living in Detroit will generally have more use for a news item pertaining to crime in that city than a story on crime in San Antonio. Certainly the college football quarterback will find stories appearing in Sports Illustrated more interesting and useful than articles that typically appear in Redbook.

Specialty media such as magazines and cable television supply specific types of information and programming to identifiable audience segments. But when it comes to daily newspapers, radio newscasts or the evening television news, a much more diverse audience must be satisfied. These media which have historically sought broad based appeal have succeeded. Television newscasts for example have traditionally attracted an audience that is highly diverse in terms of both demographics and psychographics (Frank & Greenberg, 1980).

But how can a broadcast editor hope to maintain such a broad constituency in view of emerging technologies such as cable

television which is now available in more than half of all American households? Similarly, videocassette recorders offering home entertainment ranging from aerobics to pornography have found their way into nearly one third of all households in the United States. These new technologies provide the opportunity for people to decide upon programming suited to individual tastes. But while cable television and videocassette recorders provide individuals with the opportunity to "program" their own entertainment, neither offer the opportunity for home programming of local news.

Thus the broadcast editor now finds himself in the precarious position of programming a newscast for an audience that has become highly discriminating in terms of program choices. How can a broadcast news editor satisfy such a broad constituency in view of the emerging options to which audiences have become accustomed? One possible answer to this question is that editors must target specific audience segments with news and information germane to their interests. Such an approach parallels the rise of specialty magazines and specialty programming on cable. But how does one assess shared interests and processing tendencies among audience members? One answer may come from recent advances concerning "schema theory" in the domain of cognitive social psychology.

Social psychologists disagree on whether the schema notion has advanced enough to be considered a formal theory. However, the recent plethora of literature on the topic would tend to suggest that the schema concept may be well along the way in that

direction. But what are schemata? A Schema may be viewed as a "cognitive structure that represents organized knowledge about a given concept or type of stimulus" abstracted from prior experience (Fiske & Taylor, 1984, pg. 139). For any given news topic such as politics, economics or social welfare, people have from zero to many schemata upon which to draw. Research suggests however, that most people use relatively few schemata in the course of information processing. Terms such as prototypes (Cantor & Mischel, 1977, 1979), frames (Minsky, 1975), stereotypes (Lippmann, 1922), social scripts (Schank & Abelson, 1977) and cognitive maps all share a basic theme with the schema concept. While subtle differences between the concepts do exist, they all refer to a categorization plan by which an individual summons a concrete image of the so-called "average category member (Rosch, Mervis, Gray, Johnson & Boyes-Braem 1975; Rosch, 1978)." In this sense the terms are synonymous.

The concept of the "average category member" stems from work begun four decades ago. Solomon Asch (1946) found that people combine personality traits of another person in developing an overall impression. He discovered that people tend to clarify the picture by adding information not provided (Tesser, 1978). This gap filling or inference function may explain for example, why people might automatically think of Palestinian terrorists when the words "airplane hijacking" are mentioned. In thinking of a "chair" for example, most people would summon a mental picture of a four legged object used for sitting upon, rather than a king's throne or a doll house chair, even though all three

qualify as chairs.

Schema theory presumes that people are forced to be cognitive misers due to limited processing abilities. Since people simply cannot hope to hold in memory each discrete item of information encountered (Lippmann, 1922) they are forced to classify and organize information as it is received to make living more manageable. Schemata provide a means by which the world can be efficiently classified and organized.

How does schema theory help us to understand information processing with regard to the mass media? Recent researchers have isolated specific schemata that people utilize in the course of topical information processing. Lau (1984) developed a four-part political schemata typology based on election studies conducted by the Institute for Social Research at the University of Michigan. His typology suggests that people use four primary schemata in the course of evaluating political information. But it seems plausible that the politically knowledgeable may use each of the four schemata while the political dullards may draw upon only one or two schemata. Thus by assessing the degree to which audience aggregates use available schemata, we may better understand how to present messages to the news audiences. Simply stated, audiences can be studied by assessing processing proclivities and tendencies based on consensual schemata. By investigating "which" schemata are invoked by "which" audience segments, news programmers might better supply appropriate information.

To clarify this concept, a model illustrating the process of

schematic usage and activation must be constructed or adapted. Good models generally make a statement about a process. In this case, process may be associated with effective information transmission and retention between the news media and the individuals. A second goal of model building is the adaptation of a model with important social and scholarly implications. Certainly, social benefits will be derived from a better match between the message and cognitive processing abilities of the available audience. Finally, good models must be general. Since the model to be offered will apply to information diffusion in general, it may be utilized in domains well beyond the confines of commercial media institutions such as radio, television and newspapers.

This review does not seek to "test" competing models in the classic sense. Some work along these lines has already been carried out. Tamborini and Stiff (1985) for example found support for models by both Wyer and Srull (1980, 1981) and Higgins and King (1981a). Both frequency and recency of schematic activation appears to influence the retrieval of information from memory. While this research is useful indeed, the objective at this point is to merely review several prominent models that may be applied to communication research. A model embracing the basic assumptions of schema theory will ultimately be offered that will be illustrative and useful concerning the process of schematic activation.

INFORMATION PROCESSING MODELS AND THE SCHEMA CONCEPT

Information processing models permit the identification of the steps "intervening between stimulus and response (Fiske & Taylor, 1984, pg. 7)." Information processing refers to the idea that mental operations can be broken down into sequential stages. A simple information-processing theory may represent such cognitive operations as:

1. Understanding a question (Attention and encoding)
   ¦
2. Search for information on the topic
   ¦
3. Verifying answer
   ¦
4. Stating answer

[Figure 1: A simple information processing model]

Attention and encoding are the first steps in social information processing (Kahneman, 1973). Before any information processing can occur, the stimuli outside the person must be brought to the mind. Whether attention is directed outward toward encoding external objects or inward toward memory, attention is usually seen as having two components, direction (selectivity) and intensity (effort) (Fiske & Taylor, 1984).

Schema theory suggests that the individual will next summon a schema that fits the question or comment. If "airplane hijack" is mentioned, a visual picture of a "TWA jet on a Beirut runway" may be summoned. Suppose an individual is asked: "Who is behind airline hijackings?" Typically, a mental picture of "Palestinian terrorists" would come to mind.

But what transpires when the individual has an ill-defined schema upon which to draw? Typically, a weak or ambiguous image will be summoned. And what occurs when an individual lacks confidence in the schema selected? In similar fashion, the individual may then search for another schema (Fiske & Taylor, 1984) or alter the schema originally summoned (Rothbart, Evans & Fulero, 1979). If information is incongruent with an established schema, an individual may simply assume that the new information is "an exception" to the established schema. So what transpires if an individual is told that "a Norwegian organization was responsible for the hijacking of an American jet." Individuals with limited "hijack" schemata may begin forming a schema connecting Norwegians with hijackings. People with well defined hijack schemata would likely challenge the credibility of the source or conclude that the incident was non-typical.

Schemata may change when individuals are forced to counterargue their own schemata (Fiske & Taylor, 1984). Existing schemata may be expanded and refined when direct and indirect experiences challenge their accuracy and completeness. However, major alterations or revisions of a well defined schema based on a single discrepant item seem to be the exception rather than the rule (Fiske & Taylor, 1984). Verification of the schema selected is thus based on a thorough evaluation of the schema that is first invoked.

The information processing model (figure 1) illustrates in a very simple way <u>how</u> people search for information on a given topic and then verify the correctness of the answer selected.

But the preceding model fails to adequately trace the process by which schemata are activated and utilized. If people utilize schemata in the course of information processing, a somewhat formal and indeed, detailed model of the process is essential. A review of several prominent models will therefore be presented at the conclusion of this paper. But before proceeding, a thorough analysis of the schema concept will be offered.

LITERATURE REVIEW

This section presents the conceptual and theoretical bases concerning schematic thinking as applied to information processing. The objective of this section is to embed the literature on cognitive schemata in an information processing framework. The report will conclude with a model that illustrates how schema theory might benefit researchers in the mass communication field.

SCHEMA THEORY

Three strains of thought processes dominate the social psychology literature: "consistency seekers, naive scientists and cognitive misers (Lau, 1984; Taylor, 1981)." Consistency seekers are motivated to minimize inconsistencies by revising an element of a belief system such as an attitude to permit cognitive consistency thereby reducing or eliminating dissonance (Festinger, 1957; Heider, 1946, 1958). The naive scientist

approach suggests that people methodically and rationally solve problems and deduce answers from careful analysis (Jones & Davis, 1965). Recent research suggests that people rarely utilize such precision in problem solving (Nisbett & Ross, 1980).

The third major strain of thinking and perceiving suggests that people are "cognitive misers," forced to economize with regard to information processing (Crocker, Fiske and Taylor, 1984; O'Sullivan & Durso, 1984; Tesser, 1978; Valenti & Tesser, 1981). This concept of the "cognitive miser" stems from work beginning with Bartlett (1932). He suggested that cognitive "organized knowledge structures" which he called schemata develop and grow as people develop expertise in a given topical area.

The chief objective in schematic thinking is ease and efficiency in handling information so that the essence of the information can be used quickly for ordinary human interactions and judgments (Cohen, 1981). Social schemata help to "structure, organize, and interpret new information; they facilitate encoding, storage and retrieval of relevant information; they can affect the time it takes to process information, and the speed with which problems can be solved. Schemata also serve interpretive and inferential functions (Crocker, Fiske & Taylor, 1984, pg. 197)."

When new information is deposited into a schema, the structure grows in complexity. Complexity implies cohesive linkages between a wide variety of concepts. To visualize the concept, consider an example from the physical sciences. Bohr's model of the helium atom with a pair of neutrons, protons and

electrons will suffice. This may be viewed as the physical science equivalent of a simple schema. Alternatively, gold with 79 protons and electrons and 118 neutrons is a highly complex structure. A complex schema, like gold is highly compact and hard to alter. Each electron may be viewed as a discrete piece of information. But the collective atom is the most important unit.

One might wonder if shared belief systems and the schema concept are semantic equivalents. While the two overlap, their differences are great. Shared belief systems provide avenues whereby people may "communicate thoughts and ideas (DeFleur & Ball-Rokeach, 1982, pg. 138)." Rokeach suggests that people utilize a highly organized belief-attitude-value system which guides the behavior of the individual. "All of these conceptually distinct components--the countless beliefs, their organization into thousands of attitudes, the several dozens of hierarchically arranged terminal values--are organized to form a single, functionally interconnected belief system (Rokeach, 1969, pg. 215)." Near the core of the belief system is a set of relatively stable and unchangeable beliefs. At the perimeter of the system lie the many unimportant and changeable beliefs.

As with theories associated with shared belief systems, schema theory suggests that highly evolved schemata are much more difficult to alter than simple schema. And shared schematic concepts, that of a "chair" or "democracy," for example, permit people to communicate and exchange ideas. For Rokeach (1969) certain beliefs (primitive) are learned by direct contact with the object of belief and are reinforced by general agreement by

one's peers. These indisputable truisms such as "the sun sets in the west" or "nothing is certain but death and taxes," tend to be located at the center of the belief system. They are also probably a part of well defined schemata for "the solar system" and the "tax system."

At this point the theories part ways. Schema theory suggests that people are active processors of information and that schematic thinking derives from the need to organize thinking for the purpose of cognitive economy. As such, it may serve as an appropriate modification to Rokeach's approach despite significant differences inherent to the underlying assumptions between schema and consistency theories. Consistency theories presume that people try to make information consistent with their belief system. But contrary to cognitive consistency theories, schema theory rests on the assumption that people are not highly motivated to make their thinking consistent with general principles such as values and attitudes stored in the mind.

A major criticism of the work carried out by Rokeach is that the operationalized constructs cannot be adequately measured. In the words of Littlejohn, "His attempt to reduce all values to a standard list and to describe the value system in terms of a simple ranking is unrealistic at best and ludicrous at worst. The time may be right to modify Rokeach's approach so that it is consistent with recent action-oriented, rules-based notions of human behavior (Littlejohn, 1983, pg. 157)." Schema theory offers the prospect of utilizing theories associated with shared

belief systems in a more quantifiable manner.

Social Cognition researchers propose that people identify categories of object stimuli, and apply appropriate schemata to them. Thus a schema for bird is applied to a bluejay rather than an airplane even though both have wings and fly through the air. People assess similarities among objects and then derive an average or central tendency for the category (Rosch, 1978). They then make a cognitive comparison between the available schemata prototypes before assigning an object to a specific category. This process utilizes both prior experience and inference (Hayes-Roth & Hayes-Roth, 1977).

Schema theory also rests on the assumption that old information affects the manner in which we "interpret new information in social settings" and elsewhere (Fiske & Dyer, 1985). Knowledge about others and ourselves guide our responses to new information. This has been studied in work on stereotyping (Allport, 1954; Lippmann, 1922), on impression formation (Asch, 1946; Bruner and Tagiuri, 1954), and on attribution (Heider, 1958). Social schema researchers have built upon this foundation to explain how prior knowledge guides attention, memory and interpretation of social information (Fiske and Taylor, 1984).

Before proceeding, several key issues must be resolved. First, numerous types of schemata may exist such as object schemata, the self schema and event schema (scripts). However, social psychologists have focused their research on four types of schemata that might come under the rubric of "social schema." A

definition of the four schema categories upon which research has been carried out will be provided (Fiske & Taylor, 1984, pg. 149).

1. Person schemata: People's understanding of the psychology of typical or specific individuals, composed of traits and goals, helps them to categorize others and to remember schema-relevant behavior.

2. Self-schemata: General information about one's own psychology makes up a complex, easily accessible verbal self-concept that guides information processing about the self.

3. Role schemata: Intergroup perception and stereotyping are affected by role schemata that describe the appropriate norms and behavior for broad social categories, based on age, race, sex and occupation.

4. Event schemata: People's prior knowledge of the typical sequence of events on standard social occasions helps them to understand ambiguous information, to remember relevant information and to infer consistent information where it is missing. Schank and Abelson (1977) have called these action based or event schemata scripts.

The four types of schemata listed above offer a starting point in the study of individual schemata utilized in the course of assessing news and information. Most news stories possess elements a particular "event." Scripts are perhaps the single most important consideration for media researchers as news and information is presented in these terms. But other schemata such as the "person" schema by is also important as people play major roles in most news stories.

At a less abstract level, Lau provides a typology of four primary schemata that people use when approaching political information. This seems a wise and prudent starting point for

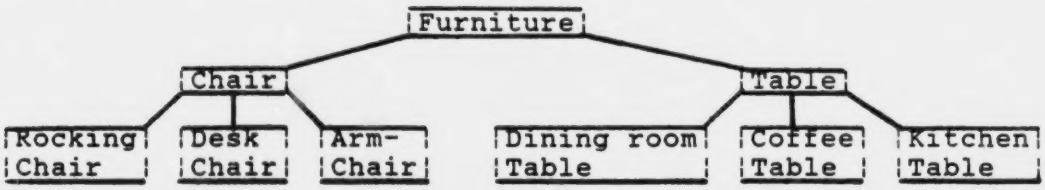
media researchers since political information accounts for approximately one-third of all information presented in newspapers and through the broadcast news media (Gans, 1979; Wicks, 1986).

Lau (1984) suggests that people engage combinations of the following primary schemata when approaching political information: (1) issues, (2) group relations, (3) party identification and/or (4) candidate [politician] personality factors. For example, does reporting that a bill in Congress is backed by the "Democrats" activate a schema in certain people? Or does mention of a specific issue such as the "federal deficit" or "international terrorism" cause certain people to attend to the message? Schema theory would suggest that people aggressively pursue information if it triggers a well developed schema.

Lau's definition of political schemata by topics (issues, groups, parties, personalities) stems from data compiled by the University of Michigan Center for Political Studies (CPS). The data were collected to assess candidate voting patterns. Lau suggests that voters likely apply the same schemata in evaluating political information as they do in evaluating candidates. "Thinking about more general political schemata [as opposed to the politician schema]... allows one to consider the processing of information about politicians, but it also is relevant to processing information about other countries or governments, about specific government policy actions, about Supreme Court decisions, about political tolerance, etc."

The following illustration may help clarify different levels

of abstraction for similar concepts. The upper level is the most abstract schema. The second and third levels represent more precise levels of the schema (Cantor & Mischel, 1979, pg. 15).



[Figure 2: Levels of abstraction for everyday objects]

Schema theory suggests that people typically develop a schema for each of the items listed above. The highest level is the most abstract level, in this case "furniture." However, the concept lacks clarity and precision. Unless a house is entirely unfurnished, it is doubtful that a person would say he needs to go to the store to purchase "furniture." But he may say that he needs to purchase a new "chair" or "table." Thus the second level of abstraction tends to be utilized with the greatest regularity. Scholars (Rosch et.al. 1975; Rosch, 1978) suggest that the optimal level of abstraction is the middle level since it provides for broad and inclusive categorization while permitting a degree of descriptive richness.

In applying a similar criteria to news and information processing, consider the following depiction of a hypothetical political thought hierarchy:

[Figure 3: Possible levels of abstraction in news processing]

A person would rarely say he is in need of more "political news." He is more likely to say that he needs more information on a political "issue" or a "politician" or that he would like to know how the "democrats" stand on an issue. As with the furniture example, the middle level appears to offer the desired mix or richness and generality in the concept.

Suppose for example that certain people have a highly developed issues schemata but poorly developed politicians schema. By explaining specific information based on the "issue" rather than in terms of a "politicians" reaction, it seems likely that a message would stand an optimal chance of integration and retention. And similarly, by cueing the proper schema, perhaps in the introduction of a news item, it seems that news managers might stand an excellent chance of activating the most receptive schema.

Media researchers will find the greatest utility in using schema theory at the the level utilized by Lau. The labels, while general, are specific enough to be observed and ultimately studied and measured. While "candidate personality factors" might clearly be included in the "person" schemata, the former provides a means by which media researchers might more precisely analyze the impact of the messages sent.

A second issue is how schemata develop and are activated. A schema begins when a person comes in contact with a new idea or concept. There is nothing mysterious about the process; it is simply the basic root of social learning. Abelson (1976) demonstrated that as people encounter information which is in

harmony with or compatible to an established schema, the structure grows in complexity which is defined here as more abstract and more general. Schemata grow from concrete to general until they are highly sophisticated. Consider the child who is watches a newscast and sees Palestinian terrorists hijacking a plane on a television newscast. The schema constructed may suggest that bearded men steal planes. More information however will lead the child to alter the schema. And eventually, the child will develop a schema which incorporates other essential elements of the story, such as the political motivations associated with terrorism and a general connection to political and economic problems in the Mideast.

Schema theory suggests that a concrete example forms an impression which serves as a foundation. As knowledge accumulates, the structure grows in complexity and abstraction. Links between concepts contained within a schema develop as individuals make connections between concepts. As one develops expertise in a topic, the schema grows in organization and compactness. A tight or compact schema is one which is highly developed and is relatively unwavering. "Compactness," as with the earlier example of the gold atom, refers to density rather than absolute size.

Schemata may be used in different ways according to the level of development. For example, studies suggest that "experts" use "schema-discrepant" information as well as "schema congruent" efficiently while "novices" tend to rely more heavily of schema congruent information (Fiske, Kinder & Larter, 1983).

Experts tend to be less willing to alter a schema when confronted with discrepant information since they apparently have more invested in their schemata than do the novices (Crocker, Fiske & Taylor, 1984). However, people with well-developed schemata seem willing to assimilate "exceptions to the rule" without dramatically altering the schema.

A third critical issue pertains to which of many schemata may be activated when confronted with a news item received through the media. Incoming information typically invokes either the most developed or the most recently activated schema. As of yet, it is unclear which will be activated although researchers continue to probe this question (Higgins & King, 1981a, 1981b; Wyer & Srull, 1981). Recent studies have focused on what is known as the "priming" effect. One view of priming is that by placing a concept at the top of the mental heap or "storage bin," it displaces others in a downward direction (Srull & Wyer, 1979; Wyer & Srull, 1980, 1981). If for example, a person learns of five airplane hijackings in a month, he is likely to activate a Mideast hijack schema if he hears a portion of newscast which refers to "...passengers arrived safely." This example offers an illustration of how both frequency and recency of activation may cause an individual to select one schema over another.

A fourth critical issue pertains to the manner in which schemata change. Schemata resist change even though people rarely find a precise fit between a schema and a piece of information (Crocker, Fiske & Taylor, 1984). Discrepant information can cause a schema to change when the discrepant message is irrefutable or

undeniable. A moderate mismatch between the schema and the message typically leads to message assimilation. And if the discrepant information may be viewed as situational, or an exception to the schema, it clearly will have little impact (Crocker, Hannah & Weber, 1983).

Researchers have taken a look at this process in assessing stereotypes that people attribute to groups. People tend to view social groups (i.e., construction workers, legislators, athletes) in a certain prototypical manner. This research has led to three models of schematic change.

1. The bookkeeping model proposes that each discrepant encounter changes the schema gradually (Fiske & Taylor, 1984).

2. The conversion model proposes that a single concentrated encounter with incongruous information can change a schema totally (Rothbart, 1981).

3. The subtyping model suggests that incongruence causes the perceiver to form subcategories within the overall schema (Taylor, 1981).

The subtyping model has received empirical support when these models were pitted against each other (Weber & Crocker, 1983). Specifically, people apparently have little difficulty making an exception to the rule when it comes to schemata. Suppose a person reads of a Palestinian "terrorist" who forcibly takes over an airplane. He then passes out flowers and the hostages are released. While the incident clearly contains elements of the prototypical hijack situation, an "exception" made this "script" strikingly different from what one would expect. In this case, it is possible that a moderate change

might take place in the schema. However, it also seems clear that the incident might be simply filed away as a non-prototypical occurrence.

A final point pertains to distinction between "schematics" and "aschematics." People may be considered either schematic or aschematic with regard to specific types of information. For example, one person may have a highly developed schema for soccer while another person fails to comprehend the action on the field and simply wishes the players would stand still long enough to be counted (Crocker, Fiske and Taylor, 1984; Markus, 1977; Markus & Smith, 1981). The term "aschematic" may be somewhat misleading. By virtue of the fact that an individual sees the action on the soccer field, the rudiments of a schema have begun. Simple introduction to a stimulus will typically cause an individual to begin the construction of a schema. Nonetheless, the term refers to a person with an extraordinarily limited schema.

Thus this review leads us back to the original proposition: Certain types of news and information (i.e.: politics, economics or science) can activate shared or consensual schemata in audience members. The degree to which individual audience members use each schema can also be measured. Consequentially, audiences can be segmented according to which of the schemata are utilized most.

The applied significance of this proposition is clear. Traditional measures of audience categories such as demographics and social class should be abandoned, at least for news programming, under this proposition. The traditional measures of

audience types should be replaced with cognitive measures of schema usage. This concept in turn leads to the prospect of providing messages that best suit the greatest number.

Consider this hypothetical example:

> Television news market X is comprised of three main groups.
>
> Group Y1 works in state government and represents 30% of the audience. Due to the nature of their jobs and the social circle within which they operate, they might be considered political "experts." As such, they tend to use an assortment of schemata when evaluating political information.
>
> Group Y2 is made up of blue collar workers and also comprises 30% of the audience. Members of this group rarely have direct dealings with the political machinery and might be considered political "novices." As such, they tend to use only a single structure, such as the party identification in evaluating political information.
>
> Group Y3 is comprised of middle management personnel and represents 40% of the audience. The social circle within which this group operates requires a reasonable familiarity with specific political issues. In addition, this group places a premium on party identification.
>
> Under such a scenario, news managers may "program" information in a fashion which is best suited for a specific set of audience segments. Since all groups for example, utilize the "party identification" dimension, it may be used prominently. Similarly, "issues" are utilized by a large audience segment.
>
> (Note: The use of "social class" as a variable upon which audiences may be segmented is coincidental. The example was set up in this manner simply to enable readers to conceptualize the primary thesis in a conventional fashion prior to moving toward the more abstract notion of segmentation based entirely on cognitive schematic usage).

The schema concept thus seems to offer a possible explanation on why people tend to integrate certain news items while totally failing to integrate or recall others. Schema theory may explain why people go out of their way to acquire

certain types of news and information while ignoring or avoiding other types. It also appears to dovetail with theories associated with cognitive complexity, interest and involvement. Individuals may vary in their own complexity across topics. "Small children typically are cognitively simple, processing information in rather global, undifferentiated terms (Littlejohn, pg. 130)." As they develop sophistication and maturity, they become more cognitively complex. In similar fashion, as people develop expertise in a topic area, they grow more interested and involved. As one develops a complex set of schemata for use in information processing, one becomes more cognitively complex.

In large part, the external information environment determines what schemata are developed. In view of this, agenda setting theories seem to complement the schema concept. That is, schemata will develop and grow based in large part on what is selected for presentation by news managers. Yet random exposure to banner headlines or the lead story on the evening news can hardly be considered the sole determinant of what schemata will evolve. Information availability is also related--those with access to modern communication tools such as radio and television have a greater opportunity to receive information. Innate intelligence or effort may also play a role in schema development. Expectations by peers and colleagues in the workplace that an intelligent person keeps informed will also play a role. And the so-called "civic obligation" of people to keep abreast of current affairs may serve as a motivation to obtain information. Indeed, the list of reasons for schematic

development may be nearly endless. The basic point is this-while some growth and development is clearly a function of random information encounters, a wide variety of reasons lead to schematic growth and development.

In summary, the term schema refers to an organized knowledge structure based on a subjective theory that guides a person in processing information (Fiske & Linville, 1980; Tesser, 1978). In guiding thought processes, schemata grow and develop from moment to moment due to the addition and incorporation of new inputs of information (Bartlett, 1932; Fiske & Linville, 1980). Schemata contain a network of associations that provide rules for making inferences about the stimulus (Fiske & Taylor, 1984).

COMPARISON BETWEEN SCHEMATIC PROCESSING MODELS

If audience segments utilize consensual schemata in the course of assessing and evaluating incoming information, it is essential trace the path through which the information must pass to continue the inquiry. Thus, a series of somewhat formal schematic information processing models will be evaluated. While features of each seem to fit well with schema theory, a model offered by Hastie (1981) will ultimately serve as one best suited for media researchers.

Lave and March (1975) suggest that "good models" are simple and rely on a limited number of assumptions. Another goal of good models is the possibility of generating a large number of predictions. And a final requirement suggests that good models

typically produce interesting implications which surprise us and are not immediately obvious from the assumptions.

The Hastie model, by virtue of its simplicity provides an opportunity to trace the process of schematic processing with relative ease. A good model of information processing should seek to explain not only how information is processed, but also if information is effectively and efficiently processed. Three path models illustrating the process of schematic thinking will be introduced. Conspicuously missing are models which separate the long term and short term memory stores (Atkinson & Shiffrin, 1968). This is because schema theory operates from the assumption that short term memory is merely that portion of the long-term memory that is currently accessible or activated (Norman & Bobrow, 1975, 1976).

The "data-pool" model (Norman & Bobrow, 1976) outlines a course by which physical signals reach the sensory organs and are perceived. The new information is condensed and simplified for brief storage in short-term memory. "It then becomes part of the 'data pool' which is checked against the reservoir of 'memory schemata' to determine whether it can be appropriately integrated. If assimilation is achieved, the information becomes part of the individuals repertoire of schemata. Failing integration, either because no suitable schema is available or because an overload of information prevents preliminary processing, the information passes quickly from consciousness (Graber, 1984, pg. 123)."

The architects of this model propose that cognitive

processing is based on several properties (Norman & Bobrow, 1975, pp. 123-125).

1. There is a single, limited pool of resources from which processes must draw.

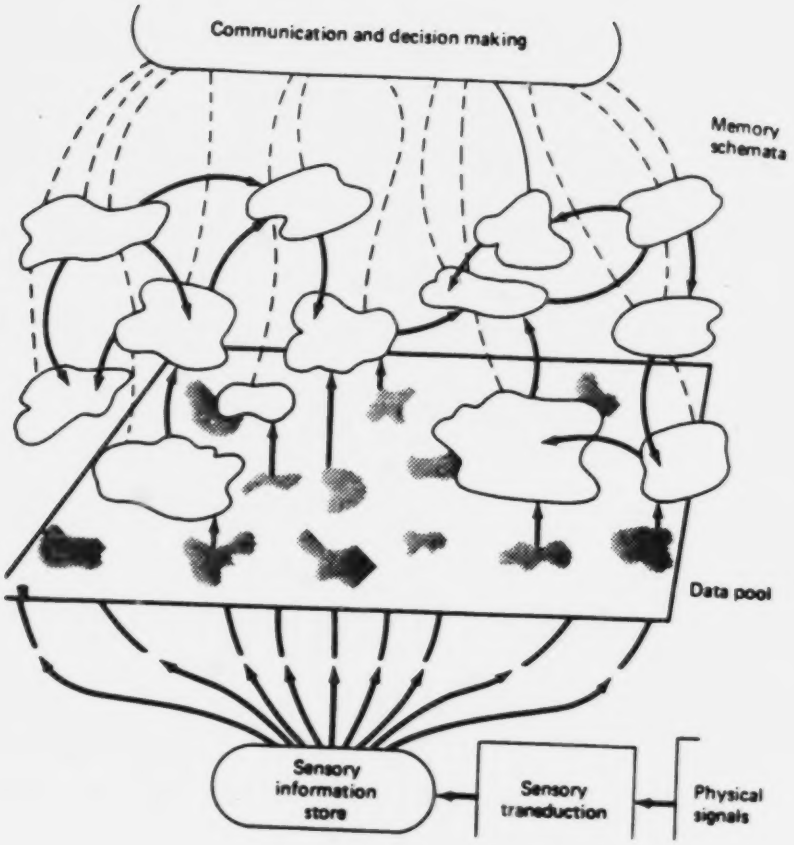
2. Memory is constructed of active units or schemata, that use the data available in a common pool, perform computations upon these data, and then both send new results back (into the common pool or to other schemata) and/or request specific information from other schemata. Schemata communicate with one another either directly or through the data pool.

3. Schemata are required. A schema consists of a framework for tying together the information about any given concept or event, with specifications about the types of interrelations and restrictions upon the way things fit together. Schemata can activate procedures capable of operating upon local information and the common pool of data.

4. Schemata can be invoked by the occurrence of data in the common data base relevant to their operations, or by requests from either other schemata or the central communication mechanism.

5. There are no fixed memory locations in the head; therefore, memory structures must refer to one another by means of descriptions of the information that they seek.

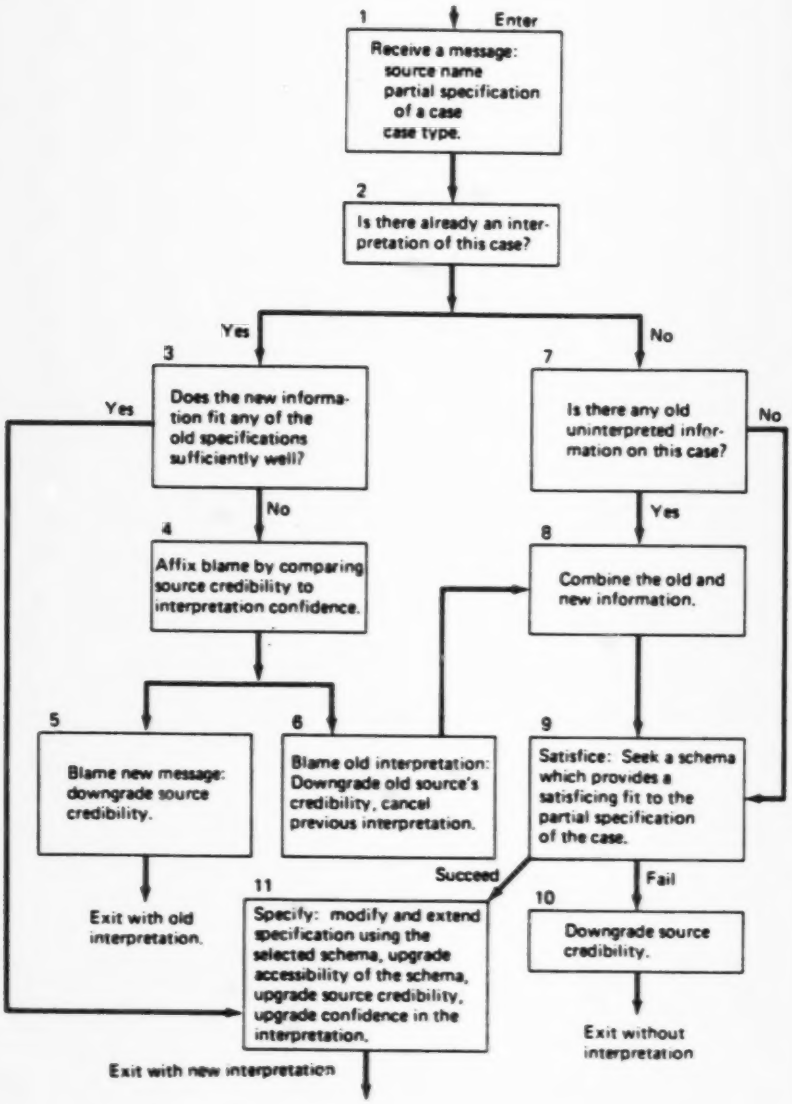
The "data-pool" model suggests that cognitive processes are driven by stimuli arriving at the sense organs. People respond to the environment they encounter first hand or through the media by selecting appropriate schemata. For example, the introduction to a political television news item might prime schemata associated with issues. But as the piece unfolds and it becomes clear that it will deal with a political personality, the issues schema might be retired and another more appropriate schema selected.



[Figure 4: Norman & Bobrow (1976) "data-pool" model]

As Norman and Bobrow clearly illustrate, the process of moving from schema to schema is somewhat fluid. And a good number of schemata might be linked at any given time. The selected schemata provide conceptual guidance in determining both where else to seek new data and how to interpret current data. The Norman and Bobrow model provides a useful overarching framework concerning information processing. However, this model provides little opportunity to dissect a given topic such as

politics and assess which schemata are at work. It also fails to conceptually stipulate in adequate detail the steps between reception of the message and response of the individual. Other scholars (Axelrod, 1973; Hastie, 1981) have offered models that explain the process of schematic thinking in greater detail.



[Figure 5: Axelrod Process Model (1973) For Schema Theory]

The 11-stage Axelrod model provides for processing of

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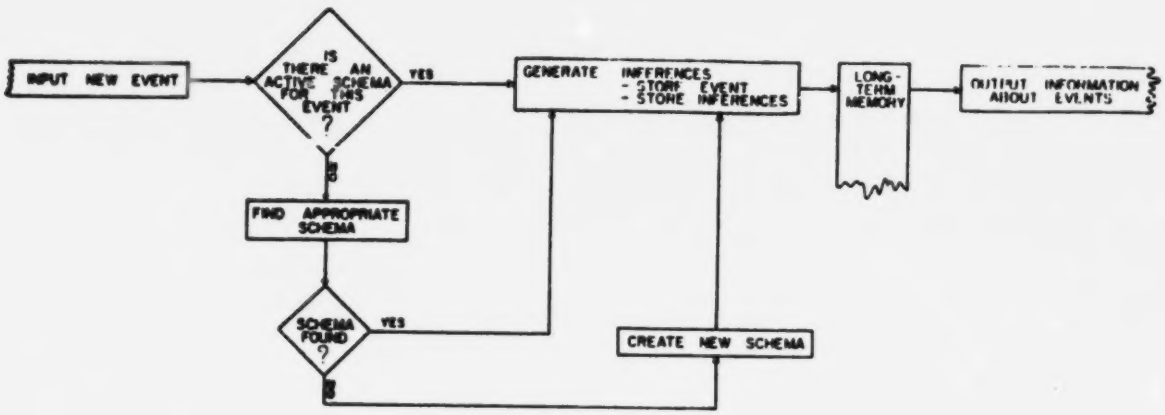
information based on a series or "yes" or "no" questions. Messages are received and a decision is made on their relative worth. If it is determined that processing would be beneficial, a second set of questions will guide processing based on stored concepts or information. If the questions are affirmatively answered, that is, if the information is deemed useful, interesting or important, and is related to an established schema or set of schemata, then it is easily assimilated (Axelrod, 1983; Graber, 1984).

Consider the manner in which a news item might pass through this model. Suppose an Eskimo unaware of different climactic conditions around the world heard that it had failed to rain for 10 years in the Australian bush country and that men were expiring due to dehydration. He may fail to understand the meaning of the news item since he may be unaware of the fact that bushmen have no ice to melt to make water. In this instance, the information may exit without interpretation since the Eskimo is aschematic with regard to dehydration in the desert. But if the Eskimo had been stranded in a portion of the frozen tundra devoid of water and ice, he certainly would find an appropriate schema upon which to draw. A third option in the Axelrod model suggests that the Eskimo may alter or replace a previously held schema. In this case, the Eskimo might deduce that some people live in areas without adequate water or other resources.

Hastie (1981) offers an alternative to the models previously discussed which seems to embrace several essential features of both models. The diagram suggests that schemata are activated

to give structure to information. The underlying assumption is that the use of schemata are essential in the course of comprehending news and information. But the Hastie flow chart departs considerably from the Axelrod diagram in that it fails to provide an opportunity for information to exit without interpretation.



[Figure 6: The Hastie (1981) Information Processing Model]

The diagram emphasizes the activation and application of a schema to give structure and transform event information (Hastie, pg. 44). This model conforms well to the assumption underlying schema theory--that people are active, goal seeking and purposive (Bower, 1975).

The Hastie model suggests that people must react to an event in one of two ways; either find an appropriate schema or begin the construction of a new schema. Consider a point concerning processing of television news information. Graber (1984) notes that of "the 15 to 18 stories presented in a television newscast,

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no more than one is retained sufficiently well so that it can be recalled a short time afterward (Graber, 1984, pg. 202)." One might conclude that most of the stories failed to activate an appropriate schema and simply exited without interpretation. Graber provides an alternative explanation (Graber, 1984).

> Use of schemata "allow individuals to extract only those limited amounts of information from news stories that they consider important for incorporation into their thinking. The Schema process also facilitates integration of new information into existing knowledge."

In other words, a person may fail to recall a news item shortly after exposure because he already knew the information. Or to put it another way, the new information simply confirmed what was already filed away and therefore failed to create a lasting impression. This interpretation suggests that the items conformed to a developed schema and did not provoke the development of a new schema.

Lau (1984, pg. 10) offers an explanation on the retention of political information:

> "Certainly some exposure to politics is self-selected, but a good deal of it is random or haphazard. When a person is presented with some political information (for whatever reason), the individual tries to "fit" that information into a pre-existing political schema. If the information is irrelevant to the schema, it is unlikely to be recalled. If the information is relevant to and consistent with a schema, it is very likely to be remembered. Whether information which is relevant but consistent will be remembered depends on the level of expertise or development of the schema."

In effect then, it is clear that the three models presented are not at odds with each other. Axelrod, Norman and Bobrow and Hastie agree that schemata will inevitably be used when an

individual comes in contact with specific types of information. The following section will provide an analysis of the subtle differences between the models.

ANALYSIS

The "data-pool" model offered by Norman and Bobrow serves as an appropriate illustrative model. It clearly traces the process by which schemata are activated. However, it fails to adequately explain the precise channels through which specific types of information must pass during the processing of information. Norman and Bobrow provide no clues on schematic measurement. Theoreticians (Taylor & Crocker, 1981; Fiske & Linville, 1980) have pointed out that methods of measurement of schemata are essential for the schema concept to survive as a theoretical construct. While the "data-pool" model has intuitive appeal, it fails to provide an opportunity for researchers to test its merit. As such, support for this model must come via the indirect route; that of providing support for alternative models that are non-competitive with the "data-pool" model.

At the core of the Hastie model is the belief that the individual is active, goal-seeking and purposive (Bower, 1975). Fundamentally, this point seems to amplify a basic proposition of schema theory. In contrast to the Axelrod model, the Hastie model fails to provide an "escape valve." In this instance, "escape valve" refers to a departure of information without interpretation. Axelrod (1973) for example, argues in favor of three possible outcomes. The are: 1. Exit with old interpreta-

tion; 2. Exit with new interpretation, and 3. Exit without interpretation.

In keeping with schema theory as applied to the processing of news information, the lack of an escape valve may be a strength. News managers typically strive to supply only information that is germane to the audience. Treatment of even the most complicated information is painstakingly provided in a fashion that can be easily assimilated by virtually all audiences. Editors operate under the assumption that highly complex news items, such as the specific details of the molecular composition of a new drug on the market, will be of little use to the mass audience. Thus, at least where commercial broad based media are concerned, an "escape valve" seems insignificant.

The Axelrod and Hastie models provide a framework that can be tested. By conducting experiments, for example, with different categories of subjects, it is possible to evaluate processing operations carried out as information passes through the formal model. The models appear helpful in providing a clear explanation of the process of human cognition as it pertains to information acquisition through the mass media.

For the purpose of depicting the process by which news and information is processed, the Hastie model seems to incorporate most of the virtues of the Axelrod and Norman and Bobrow models. Why then is the Hastie model preferable to the other models? The obvious answer is generality. As stated in the introduction, the goal is to find a model generic enough to cover most mass media information yet specific enough to explain the process of

schematic activation. And since the actual number of steps in the model is limited, it seems evident that it might be subjected to rigors not possible with more complex models. Hastie has offered a model that is not only theoretically plausible, but empirically testable.

The Hastie model clearly illustrates the role of schemata as an intervening variable. While this model contains elements which conform to the assumptions underlying schema theory, it has not been tested by communication researchers. Specifically, if the model works, it should be possible to invoke a particular schema and measure the inferential and recall capabilities of audience members, aggregates or segments. Schema theory promises media researchers the prospect of moving away from self-report data; clearly the least precise measure available. In isolation, the Hastie model is nothing more than a theoretical map depicting the manner in which information passes through the mind. As such, it and the other models presented are little more than illustrations of a process.

But the Hastie model, when applied to news and information acquisition, may offer clues on what unlocks the so-called cognitive `black box.' And in so doing, it may provide an explanation on how agenda setting, uses and gratifications and other theories fit together with cognitive processing rooted in schema theory. Fruitful theories typically provide predictive capability, heuristic value, links to the observable, parsimony and generality. Implicit to the Hastie model is the idea that people using more schemata (in absolute terms), as well as more

sophisticated schemata, will ultimately recall more information and generally infer more from the information provided.

While the Axelrod model may potentially offer a more precise explanation of the sequences associated with schematic processing, its authenticity is more difficult to verify. It seems appropriate to begin work in this area with a model that can be easily operationalized, before moving on to more complex plans. In view of this, the Hastie model with but a single possible outcome seems to offer the greatest utility for researchers in the mass communication field.

CONCLUSIONS

This paper has sought to integrate schema theory with the concept of mass media information processing. It concluded with a model that illustrates the process of schema activation. However, two key issues have thus far been skirted. First, what does the schema concept "buy" in terms of mass communication research? The simple answer is that the schema approach posits "important and researchable intervening steps in the processing of information" between input and output (Fiske & Linville, 1980, pg. 552). Implicit to schema theory is the notion that: 1. Any given topical domain, be it politics, baseball or comet watching, can be broken down into component parts. 2. That the number of schemata for any given topic can be identified. And 3. that tests on people can be administered to assess which schemata are activated. The Hastie model provides a blueprint for the study

along these lines.

The second issue pertains to the obvious fact that mental models are often merely plausible explanations of how people think rather than sources of falsifiable propositions about cognition. We have seen that different models often seem to mimic one another making it difficult to distinguish between different proposals. As such, the Hastie model seems to offer the opportunity to begin work in this area with a model that provides the opportunity to generate proposals of specific interest to mass media researchers.

But what specific advances may be accomplished through the use of the schema construct? Speculation on this question may serve as an appropriate conclusion to this paper. Advertising executives have spent long hours studying the concept of involvement. They have anguished over the components of a message that prompts people to become involved with it. The schema construct provides a context for involvement theories. Do people become involved with a product because the appropriate schema has been activated? Did Burger King, for example, simply activate a consensual schema when it introduced the "where's the beef campaign?" If so, is it possible to measure the degree to which people draw upon consensual schemata?

Consider the case of Philippines President Corazin Aquino. One may speculate that activation of the "democracy" schema in people prompted lively discussion and debate in offices and living rooms around the world. Is it possible to isolate the components of local news and information that activate the most

sophisticated schemata among the greatest number of people? And conversely, is it possible to measure schemata that are used by smaller but specific and identifiable audience segments?

These questions may only be satisfactorily answered when measurement accompanies the theoretical models. Since the news media is designed to provide messages for large numbers of people rather than interpersonally, it is essential to be begin probing the manner in which people share schemata in particular topical domains. This is an entirely new research direction for communication scholars. Yet the foundation is well rooted in the cognitive psychology literature.

This entire discussion leads a fundamental point. How does one test the merit and validity of these models? The obvious answer is that measurement methods must be advanced which will enhance the value of the schema concept. The next section of this report will focus on research designs and measurement techniques that have been employed by social psychologists during the past decade.

Note: A follow-up paper on methodological approaches to schema measurement is available from the author.

REFERENCES:

Abelson, R.P. "Script processing in attitude formation and decision making." in J.S. Carroll & J.W. Payne (Eds.), Cognition and social behavior. Hillsdale, NJ: Erlbaum, 1976.

Allport, G. W. The nature of prejudice. Reading, MA: Addison-Wesley, 1954.

Asch, S. E. "Forming impressions of personality." Journal of Abnormal and Social Psychology. 1946, 41, pp. 258-290.

Atkinson, R.C., & Shiffrin, R.M. "Human memory: A proposed system and its control processes." In K.W. Spence & J.T. Spence (Eds.), Advances in the psychology of learning and motivation: Research and theory (Vol 2). New York: Academic Press, 1968.

Axelrod, R. "Schema theory: An information processing model of perception and cognition." American Political Science Review, 1973, 67, 1248-1266.

Bartlett, F.A. A study in experimental social psychology. New York: Cambridge University Press, 1932.

Bower, G.H. "Cognitive psychology: An introduction." In W.K. Estes (Ed.), Handbook of learning and cognitive processes (Vol. 1). Hillsdale, NJ: Erlbaum, 1975.

Bruner, J. S., & Tagiuri, R. "The perception of people." In G. Lindzey (Ed.), Handbook of social psychology (Vol. 2). Reading, MA: Addison-Wesley, 1954.

Cantor, N., & Mischel, W. "Traits as prototypes: Effects on recognition memory." Journal of Personality and Social Psychology," 1977, 35, 38-48.

Cantor, N. & Mischel, W. "Prototypes in person perception." In L. Berkowitz (Ed.), Advances in experimental social psychology (Vol. 12). New York: Academic Press, 1979.

Cohen, C.E. "Goals and schemas in person perception: Making sense out of the stream of behavior." In N. Cantor & J. Kihlstrom (Eds.), Personality, cognition and social behavior. Hillsdale, NJ: Erlbaum, 1981.

Crocker, J., Hannah, D.B., & Weber, R. "Person memory and causal attributions." Journal of personality and social psychology, 1983, 44, 55-66.

Crocker, J., Fiske, S.T., & Taylor, S.E. "Schematic bases of belief change." In J.R. Eiser (Ed.), Attitudinal judgment, 1984, New York: Springer-Verlag.

DeFleur, M., & Ball-Rokeach, S. Theories of mass communication (4th Edition). New York: Longman, 1982.

Festinger, L. A. A theory of cognitive dissonance. Stanford, CA: Stanford University Press, 1957.

Fiske, S. T., & Dyer, L.M. "Structure and development of social schemata: Evidence from positive and negative transfer effects." Journal of Personality and Social Psychology, 1985, 48, 839-852.

Fiske, S.T., Kinder, D. & Larter, W.M. "The novice and the expert: knowledge-based strategies in political cognition." Journal of Experimental and Social Psychology, 1983, 19, 381-400.

Fiske, S. T. & Linville, P.T. "What does the schema concept buy us?" Personality and Social Psychology Bulletin, 1989, 6, 543-557.

Fiske, S. T., & S.E. Taylor. Social cognition. Reading, Mass.: Addison-Wesley Publishing Company, 1984.

Frank, R.E., Greenberg, M.G. The Public's use of television: Who watches and why. Beverly Hills, Cal.:Sage Publications, 1980.

Gans, H. Deciding what's news. New York: Longman.

Graber, D.A. Processing the news. New York: Longman Publishing Company, 1984.

Hastie, R. "Schematic principles in human memory." In E. T. Higgins, C.P Herman & M.P. Zanna (Eds.), Social cognition: The Ontario Symposium (Vol. 1). Hillsdale, NJ: Erlbaum, 1981.

Hayes-Roth, B & Hayes-Roth F. "Concept learning and the recognition and classification of exemplars." Journal of Verbal Learning and Verbal Behavior, 1977, 16, 321-338.

Heider, F. "Attitudes and cognitive organization." Journal of Psychology, 1946, 21, 107-112.

Heider, F. The psychology of interpersonal relations. New York: John Wiley and Sons, 1958.

Higgins, E.T. & King, G.A. "Category accessibility and impression formation." In N. Cantor & J.F. Kihlstrom (Eds.),Social cognition:: The Ontario Symposium, Hillsdale, NJ: Erlbaum, 1981.

Higgins, E.T. & King, G.A. "Accessibility of social constructs: Information-processing consequences of individual and contextual variability." In N. Cantor & J.F. Kihlstrom (Eds.), Personality, cognition and social interaction, Hillsdale, N.J.:Erlbaum, 1981.

Jones, E.E. & Davis, K.E. "From acts to dispositions: The attribution process in person perception." In L. Berkowitz (Ed.), Advances in experimental social psychology, Volume 2, New York: Academic Press, 1965.

Kahneman, D. Attention and effort. Englewood Cliffs, NJ, Prentice-Hall, 1973.

Lau, R.R., "Political schemas, candidate evaluations, and voting behavior." Unpublished manuscript. Paper presented at the 19th annual Carnegie Symposium on Cognition, Pittsburgh, May 18-20, 1984; and the 7th annual International Political Psychology Association meeting, Toronto, June 17-20, 1984. Paper available from Richard Lau, Department of Social Sciences, Carnegie-Mellon University, Pittsburgh, PA, 15213.

Lave, C.A., & March, J.A. "Three rules of thumb for model building." In An introduction to models in the social sciences. New York: Harper & Rowe, 1975, 40-78.

Lippmann, Walter, Public opinion, New York: Macmillan, 1922.

Littlejohn, S.W. Theories of Human Communication. Belmont, CA: Wadsworth Publishing, 1983.

Markus, H. "Self-schemata and processing information about the self." Journal of Personality and Social Psychology, 1977, 35, 63-78.

Markus, H. & Smith, J. "The influence of self-schema on the perception of others." In Nancy Cantor and John F. Kihlstrom (Eds.), Personality, cognition and social Interaction, Hillsdale, NJ: Erlbaum, 1981.

Minsky, M.A. "Framework for representing knowledge." In P.H. Winston (Ed.), The psychology of computer vision. New York: McGraw-Hill, 1975.

Nisbett, R., & Ross, L. Human inference: Strategies and shortcomings of social judgment. Englewood Cliffs, NJ: Prentice-Hall, 1980.

Norman, D. A., & Bobrow, D. G. "On data-limited and resource limited processing." Cognitive Psychology, 1975, 7, 44-64.

Norman, D.A., & Bobrow, D.G. "On the role of active memory processes." In C. Cofer (Ed.). The structure of human memory, San Francisco: W.H. Freeman and Company, 1976.

O'Sullivan, C.S., & Durso, F. "Effect of schema-incongruent information on memory for stereotypical attributes." Journal of Personality and Social Psychology, 1984, 47, 55-70.

Rokeach, M. The open and closed mind: Investigations into the nature of belief systems, New York: Basic Books, 1960.

Rosch, E. "Principles of categorization." In E. Rosch & B. B. Lloyd (Eds.), Cognition and categorization, Hillsdale, NJ: Erlbaum, 1978.

Rosch, E., Mervis, C., Gray, W., Johnson, D., & Boyes-Braem, P. "Basic objects in natural categories." Cognitive Psychology, 1975, 7, 573-605.

Rothbart, M. "Memory processes and social beliefs." In D. Hamilton (Ed.), Cognitive processes in stereotyping and intergroup behavior, Hillsdale, NJ: Erlbaum, 1981.

Rothbart, M., Evans, M., & Fulero, S. "Recall for confirming events: Memory processes and the maintenance of social stereotyping." Journal of Experimental Social Psychology, 1978, 15, 343-355.

Schank, R.C., & Abelson, R.P. Scripts, plans, goals and understanding: An inquiry into human knowledge structures. Hillsdale, NJ: Erlbaum, 1977.

Srull, T.K & Wyer, R.S. "The role of category accessibility in the interpretation of information about persons: Some determinants and implications." Journal of Personality and Social Psychology, 1979, 37, 1660-1672.

Tamborini, R. & Stiff, J. "Category accessibility and recall accuracy: The impact of exposure to mass media in witness recall situations." Paper presented at the 1985 Convention of the Association for Education in Journalism and Mass Communication, in Memphis, TN, August, 1985.

Taylor, S.E., "The interface of cognitive and social psychology." In J. Harvey (Ed.), Cognition, social behavior, and the environment, Hillsdale, NJ: Erlbaum, 1981.

Taylor, S.E., and Crocker, J. "Schematic bases of social information processing," In E.T. Higgins, C.P. Herman, & M.P. Zanna (Eds.), Social cognition: The Ontario Symposium (Vol 1), Hillsdale, NJ: Erlbaum, 1981.

Tesser, A. "Self-generated attitude change." In L. Berkowitz (Ed.), Advances in experimental social psychology, (Vol. 11), New York, Academic Press, 1978.

Valenti, A. C., & Tesser, A. "On the mechanism of thought-induced attitude change." Social Behavior and Personality, 1981, 9 (1): 17-22 (1981).

Weber, R. & Crocker, J. "Cognitive processing in the revision of stereotypic beliefs." Journal of Personality and Social Psychology, 1983, 45, 961-977.

Wyer, R.S., & Srull, T.K. "The processing of social stimulus information: A conceptual integration." In R. Hastie, T.M. Ostrom, E.B. Ebbesen, R.S. Wyer, D. Hamilton, & D.E. Carlston (Eds.), Person memory: The cognitive basis of social perception, Hillsdale, NJ: Erlbaum, 1980.

Wyer, R.S., & Srull, T.K. "Category accessibility: Some theoretical and empirical issues concerning the processing of social stimulus information." In E.T. Higgins, C.P. Zanno (Eds.), Social Cognition: The Ontario Symposium (Vol. 1), Hillsdale, NJ: Erlbaum, 1981.

Wicks, R. "Portrayal of political parties by the television broadcast media in single and dual-party political systems: Comparing the Soviet Union to the United States." Paper presented at the 36th Annual convention of the International Communication Association, Chicago, IL., May 1986. Available from Robert H. Wicks, School of Journalism, College of Communication Arts, Michigan State University, East Lansing, MI, 28824-1212.